Acceptability of Covid-19 Vaccines and Determinant Factors among Health Care Givers in Government Health Institutions in Lideta Sub City of Addis Ababa; Central Ethiopia; 2022

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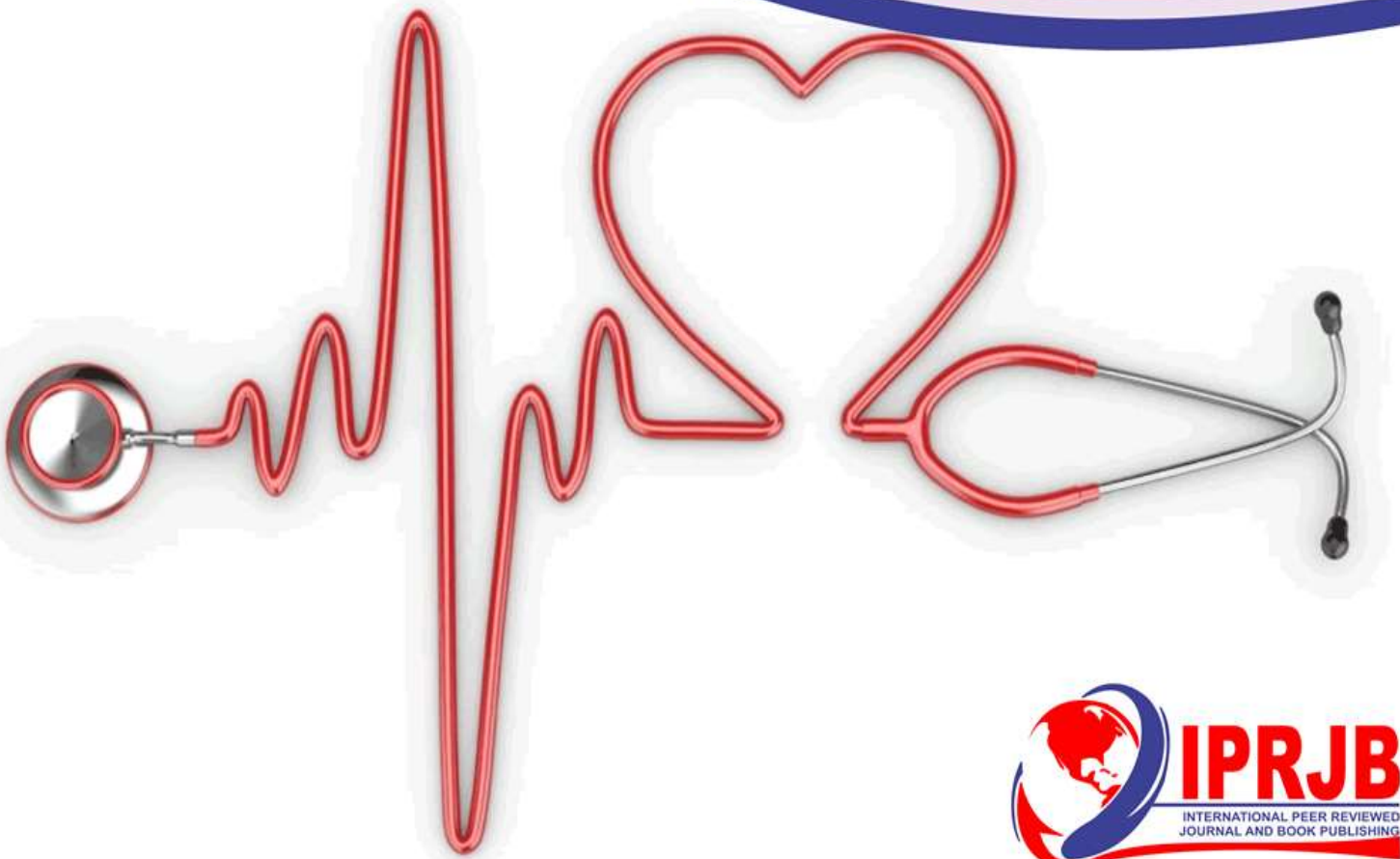
Acceptability of Covid-19 Vaccines and Determinant Factors among Health Care Givers in Government Health Institutions in Lideta Sub City of Addis Ababa; Central Ethiopia; 2022

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Article History

Abstract

Purpose: Covid-19 vaccination is important in decreasing covid-19 related severity of the disease and hospitalization, however there is a gap among health care providers towards Covid-19 vaccine willingness; But, it could be controlled by vaccination. The acceptability of health workers on covid-19 vaccine was low in 2021/22 especially in Addis Ababa. Thus, the objective of this study was to assess the acceptability of Covid-19 Vaccines and its determinant factors among Health Care provider in Lideta sub city of Addis Ababa;

Methodology: This Institutional based cross sectional study design was used among 267 health workers in government health centers in Lideta sub city. The study populations were all health workers selected and included in this study from July to August 10/2022. Stratified random sampling was used to get the desired number of sample size. Self-administered semi structured questionnaires were used. Quality of data was maintained by designing appropriate data collection instruments, pretest, and careful data entry checks. Reliability of the attitude (perception) questionnaire was checked at Cronbach's alpha coefficients of 0.72.

Results: Acceptability of Covid-19 Vaccines among Health Care providers was 70.4%. Being female [(OR= 1.96, (95%CI: 1.02, 3.55)], Being clinically suspected, [(OR= 2.3, (95%CI: 1.05, 3.71)] and Being single in marital status [(OR=1.96, 95%CI; 1.29, 8.20)] were more likely predicted with acceptability of COVID-19 vaccine in health workers in this study.

Unique Contribution to Theory, Practice and Policy: Fear of side effects and feeling of poor efficacy for the vaccine, attitude (perception) were the major reasons for Health care provider to be unvaccinated for covid-19 vaccine

Keywords: *Acceptability, Covid-19 Vaccine, Vaccine Hesitancy*

INTRODUCTION

Vaccine Immunization is mostly recognized as one of the greatest public health interventions and achievements of the twentieth century. Vaccines save lives, prevent the spread of diseases and reduce health care costs. Immunization programs are an important foundation of Ontario's health system which provides expertise in immunization and vaccine-preventable disease control. Vaccine- preventable disease epidemics have widely distributed in past years, and there is great public health need in monitoring attitudes or perceptions towards vaccination and identifying factors resulting to vaccine hesitancy and refusal (1).

World Health Organization (WHO) declared vaccine hesitancy as one of the top problems to global health in 2019; studies focused on the determinants and extent of vaccine hesitancy in Arab countries in the Middle East and North Africa region are lacking (2, 3, 4, 5).

In a global level, Eight surveys were done among healthcare givers (doctors, nurses, others) were found, with vaccine acceptance rates ranging from 27.7% in the Democratic Republic of Congo to 78.1% in Israel and similarly the systemic review in Ethiopia is 56.02% which needs further activities at different levels. A study in different African countries, such as Ghana showed the health care workers Covid-19 vaccine acceptance rate was 58% including in Lebanon and Egypt also; but still the major determinant factors were not elaborated further; Yet, accordingly Covid-19 prevalence still in place (6, 7, 8, 9). Health care workers in some countries such as in Saudi Arabia, 50.52% of the participants were willing to have COVID-19 vaccine (accepted without any delay) (11).

Corona-virus disease (COVID-19) is a serious global pandemic disease affecting more than 226 countries with nearly 512,989,831 cases and around 6,259,720 worldwide deaths. This particular originated in China at the end of 2019, in the city of Wuhan and affecting global countries. In Ethiopia; there have been 498,816 cases and 7,559 Covid-19 related deaths were reported; of which elderly peoples, chronically ill peoples and health care providers were most commonly affected from December 2019 onwards; but only 23.3% of the eligible populations got vaccinated. The systematic review of survey conducted in Ethiopia also justifies that the vaccine acceptance rate was 56.02% (3, 4). In this regard Addis Ababa and Lideta sub city in particular were mostly affected by this pandemic disease. Therefore, the objective of this study was to assess the acceptability of Covid-19 Vaccines and its determinant factors among Health Care Workers in government Health institutions/centers in Lideta sub city; Addis Ababa.

Methods and Instruments used

Institutional based cross sectional study was used in government health institutions in Lideta sub city Health office; Addis Ababa. The study was carried out from July to August 10/2022 G.C. Lideta sub city is one of the eleven sub cities of Addis Ababa City Administration, Ethiopia. Lideta sub city Health office residing about eight government health centers with different levels of private health institutions which providing both curative and preventive services for Lideta sub city population of Addis Ababa. The source population for the present study was Health care providers, working at Lideta sub city health facilities; while the study population was Selected health care providers, working in government health facilities of Lideta sub city health office selected and included in this study during the study periods. Single population proportion was employed to determine the sample size as follows.

$$ni- \quad Z^2_1 \; \underline{\alpha \; / \; 2 \; p \; (1-p)}$$
$$d^2$$

Using this formula, assumption used to get the desired sample size was; "The proportion of health care workers on 'acceptability of a COVID-19 Vaccine among Healthcare Workers in Black Lion Hospital was 67% (16). A 95% confidence interval and 0.05 maximum tolerable levels (margin of error) was assumed.

$$Ni \; (1) = (1.96)2 \; x \; 0.67 \; (1-0.67) \; /(0.05)2= 340$$

When we add, 10% non-respondent rate, final sample size was 373 participants. But due only 738 health workers of different disciplines are providing care in the government health facilities in the sub city; correction formula were used to get the desired sample size as follows.

$$Nf^* = \frac{ni}{1+n^* \; /N}$$
$$ni(\; 2) = \quad 373/1+(373/738)$$
$$nF^* = 249 \text{ and } 10\% \text{ nonresponse rate } \underline{274}$$

A Stratified random sampling technique was used to stratify healthcare workers at Lideta sub city governmental health centers staffs (Physicians, Nurses, health officers, Midwifes, pharmacist, and laboratory technologist). The number of study participants to be sampled from each discipline was determined using proportional to size allocation formula as follows;

Key; Dis 1-HC, dis2-HC = district health center (1,2,3,4,--8)
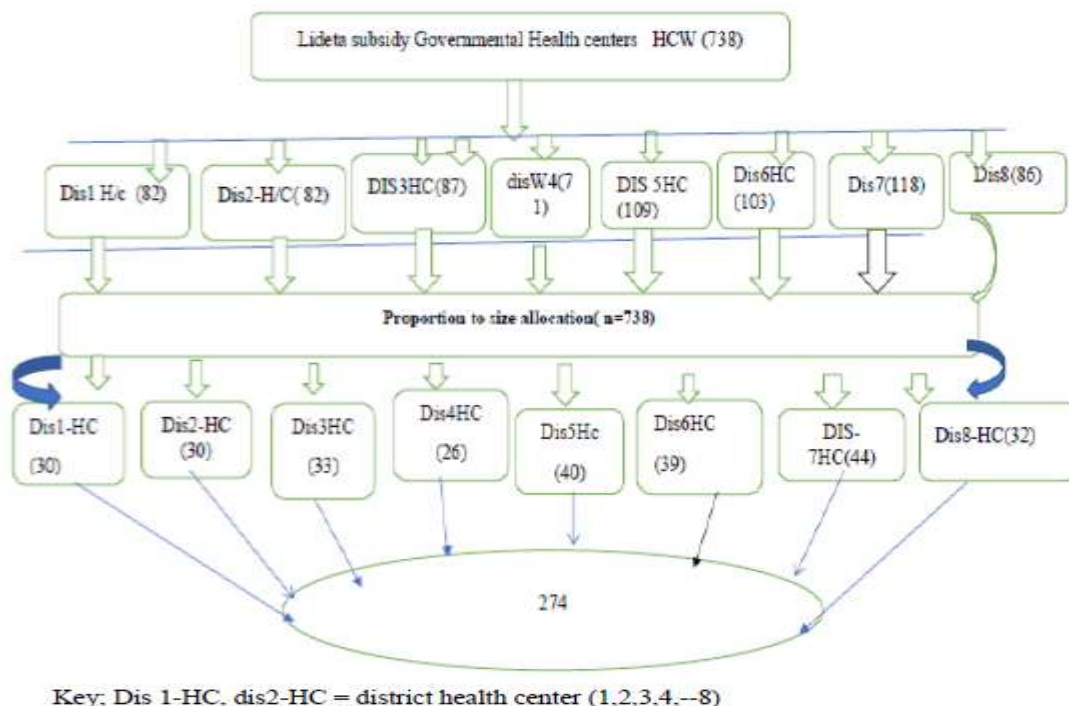
In these study health care providers who were at their working place during data collection and permanent employee residing at health facilities for more than six months during data

collection were included; where as those at working place for academic purpose (for ward attachment or practice session) as well as temporary employees less than six months stay at health facility prior to the study period were excluded. Knowledge status of the study participants for Covid-19 vaccine was assessed by eleven knowledge rerated questions. Categorization was done based on score categories (percentage score) assuming as good and poor knowledge. Those respondents who scored greater than or equals to 60% can be categorized as had good/high knowledge; where as those scored less than 60% were categorized as had low/poor knowledge. Participants Attitude (perceptions) towards covid-19 vaccine were measured by six attitude questions/items of measurements based on Likert scale five level of agreements (1-strongly disagree to 5- strongly agree). Categorization was done based on mean score as good attitude/perception for those greater than or equals to mean score while poor attitude (perceptions) for counter wards.

Self administered semi structured Data collection instrument adapted from different studies was used (1-4). The instrument/questionnaire was prepared in English language, and then translated Amharic). To ensure consistency, the questionnaire was back-translated to English. The data were collected by eight elementary school teachers who were supervised by two from sub city health office. The questionnaire contains quantitative questions in different dimensions such as socio demographic factors, knowledge and risk perception on covid-19 vaccine, willingness to be vaccinated.

Quality of data was controlled by designing standard data collection materials. Pretest was done outside of the study area to insure further quality. Appropriate training for data collectors and supervisors was done preceding data collection period and careful data entry and checks was performed. Reliability of the attitude questionnaire was confirmed by achieving the Cronbach's alpha coefficients of 0.72. In addition validity of the interview questionnaire was determined using the content validity.

Data were checked, cleaned, coded and entered into Epi-data software (version 3.1) and exported into SPSS software (version 26.0) for analysis. Descriptive statistics (e.g., frequency, percentage, mean, and standard deviation) and cross tabulations were computed and presented in tables and figures to show a general picture of the data. Statistical tests were done at 95% confidence interval. Variables with a p-value less than 0.25 in bivariate analysis were selected as candidate variables. Model fitness for multivariate analysis was checked using the Hosmer-Lemeshow test. Each variable/ covariates were assessed by Wald test. Multicollinearity (at a variance inflation factor of >10) and interaction between the independent variables were checked. Multivariate binary logistic regression analyses were computed to identify the predictor variables. Adjusted odds ratios, together with 95% confidence intervals, were determined to measure the strength and level of significance of the association.

Ethical clearance was obtained from the Ethical Review Committee Addis Ababa city Administration Health Bureau of Public Health Emergency department and then Lideta sub city Health office. Letter of cooperation and support from the health bureau and the ethical approval letter were presented to the selected health facilities. Confidentiality conditions were assured using identification numbers in the questionnaire. In addition, the participants' privacy was guaranteed by removing names and other identifiers during the data collection.

RESULTS

This particular study was carried out on 267 respondents making a response rate of 97.5% with an overall acceptability of Covid-19 vaccine was 188 (70.4%) where as 79 (26.6%) were not willing to be vaccinated. Among all respondents, 105 (39.3%) were males and 162 (60.7%) females with a mean age of 30.3 years ± 5.4 SD. Hundred and thirty four (50.2%) and 21.7% of the health care providers were married Nurses and Health Officers respectively. Among the 267 participants, 188(70.4%) participants were willing to have COVID-19 vaccine, while 79 (26.6%) were not willing to be vaccinated (Table-1).

Table 1:- Distribution of Socio-Demographic Factors of Healthcare Workers; Lideta Sub City (N =267)

Variables	Character	Frequency	Percent %
Age group (Years)	20-25	55	20.6
	26-30	103	38.6
	31-35	72	27.0
	36-40	27	10.1
	>41	10	3.7
	Total	**267**	**100.0**
Gender	Male	105	39.3
	Female	162	60.7
	Total	**267**	**100.0**
Marital Status	Single	128	47.9
	Married	134	50.2
	Separated/ divorced	4	1.5
	Living together	1	0.4
	Total	**267**	**100.0**
Profession	Health officers	58	21.7
	Nurse	105	39.3
	Midwife	40	15.0
	Pharmacist	27	10.1
	Laboratory technologist	18	6.7
	Physicians	19	7.1
	Total	**267**	**100.0**

Health care provider's knowledge and attitude (perception) for Covid-19 uptake were assessed by knowledge and attitude related questions. Regarding to this, Majority, 176 (65.9%) of participants had good knowledge of Covid-19 vaccine related knowledge questions, where as others had poor knowledge. Concerning to attitude towards covid-19 acceptability, 73 % of health care providers had good attitude and perception while the rest had poor attitude and perception. In the present study, the basic and justifiable reasons and concerns for health care providers being not vaccinated for Covid-19 vaccine were fear of side effect (30.4%), safety and efficacy issue (30.4%), the time of speed of vaccine preparation (31.6%). Regarding to professional based distribution being vaccinated for covid-19 were, 37.7% Nurses, 22.34% Health officers, 6.38% Laboratory technology professionals. (Figure 1).
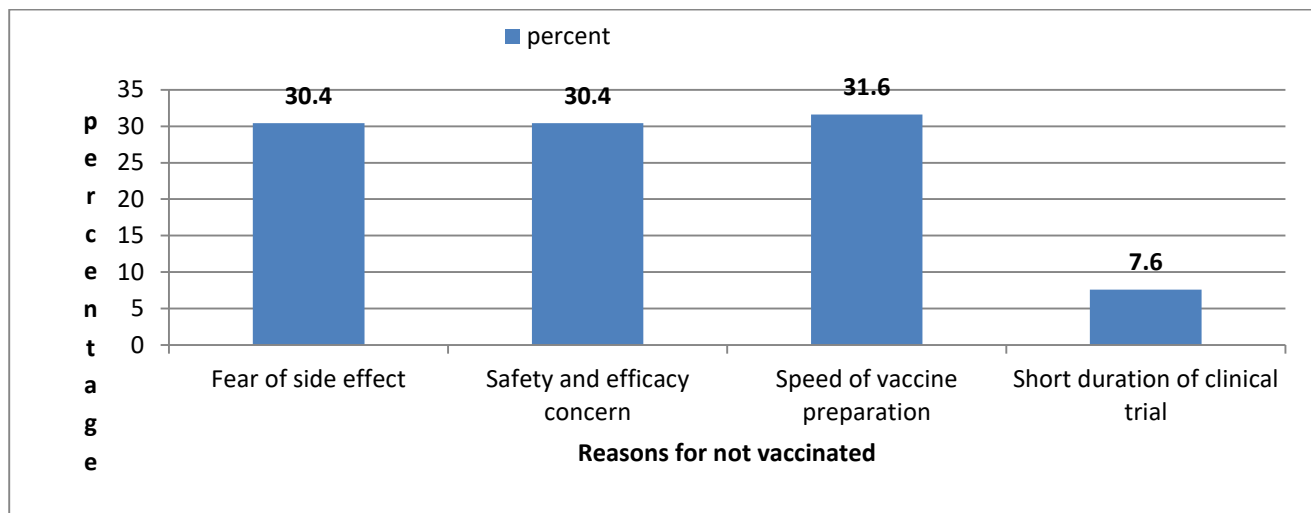
Figure 1: Reasons of Health Care Workers Being Not Vaccinated Covid-19 Vaccine (N=79)

In this study the binary and multivariate logistic regression were done to ascertain factors affecting vaccine acceptability among Health care workers in the study setting. Based on this being female in gender were 1.9 times more than vaccinated compared to being male in gender. [AOR: 1.9; (95% CI; 1.02, 3.55), (p-value , 0.043)]. Those who were clinically suspected were 2.3 times more likely got vaccination than those PCR confirmed one times [AOR: 2.3; (95%; CI 1.097,4.8) (p-value, 0.027)]. Being Single in marital status contributes to 1.96 more likely got vaccinated than being married [AOR; 1.9; (95% CI; 1.02, 3.55) (p=0.039)]. Concerning to the intention of vaccine efficacy, the intention/expectation of participants for Astra Zeneca and Pfizer were 3.15, 2.9 times more likely effective than Johnson's johns and Sino pharm with [AOR; 3.15, 2.9 ; (95% CI; 1.11,8.9, 1.13,7.56)(P –value, 0.031, 0.026)] respectively.(Table-2)

Table-2: Independent Predictors for Acceptance of a COVID-19 Vaccine in Lideta Sub City, (n=267).

Variables	Character	Covid-19 vaccine acceptance		COR (95%:CI)	AOR (95%:CI)	P-Value of AOR
		Yes Num (%)	No Num (%)			
Gender	Male	75(71.4)	30(28.6)	1 .00	1 .00	
	Female	113(69.8)	49(30.2)	1.05(0.63,1.65)	1.9(1.02,3.55)*	0.043
Have you been sick with covid-19	Yes, PCR confirmed	51(78.5)	14(21.4)	1.24(0.53,2.9)*	1.00	
	Yes, clinically	41(74.5)	14(25,5)	2.12(1.05,4.29)	2.3(1.097,4.8)*	0.027
Marital status	Single	96(75)	32(25)	1.62(0.95,2.77)	1.96(1.035,3.713)*	0.039
	Married	57(64.9)	47(36,1)	1 .00	1.00	
Vaccine prioritization	Health workers	59(77.6)	17(22.4)	2.4(1.02,5.5)*	3.27(1.29,8.2)*	0.012
	Elderly	22(59.5)	15(40.5)	1.73(0.39,7.6)	1.00	
	Pediatric	6(66.7)	3(33.3)	1.5(0.79,2.88)	1.00	
What do you think the most effective vaccine	Astra Zenica	35(66)	18(34)	1.7(0.45,3.93)	3.15(1.11,8.9)*	0.031
	Pfize	16(60)	11(40)	0.37(0.104,1.29)*	2.9(1.13,7.56)*	0.026
	Johnson Johnson	24(72.7)	9(27.3)	1 .00	1 .00	

*COR---- Crude Odds Ratio,   AOR-- Adjusted Odds Ratio,   *---Significant at P-value < 0.05 Nagelkerke R-square = 0.46*

Discussion

According to this particular study finding, the Health Care providers who were willing to Covid-19 vaccine were 70.4%. Yet, 29.6% of them were not willing to be vaccinated. This study finding had no similarity and comparability with the study done in Egypt. The study done in Egypt showed that 21% of respondents included in the study were agreed to Covid-19 vaccine. This none comparability and none similarity of this study might be explained by the nature of the study setting and difference in practice norm of the study community (13). But, the study conducted in United States of America indicated that 56% of them not accepted the Covid-19 vaccine which was higher than these study findings (14).

Meanwhile, these findings were nearly with the study conducted in France, where 77.6% of participants "agreed" to get vaccinated (15). A study in Ghana indicated that, 39.3% of health care provider's accepted and vaccinated Covid-19 vaccine; where the current study was higher than this finding. This difference might be explained by the difference in cultural practice and religion follows (16). A study conducted in Dessie, Ethiopia justified that respondents with positive attitudes/perceptions towards COVID-19 vaccination were 62.5%, but 36.0% HCWs were hesitant about the vaccine (10). A study in Addis Ababa (Black Lion Hospital) Indicated that 66.7% participants were willing to had COVID-19 vaccine, while (33.3%) were not willing to be vaccinated (12). This finding was consistent with this study and consistency might be explained similarity of the study setting and methodology.

Concerning knowledge levels of respondents 65.9% of them had good knowledge (as Covid-19 vaccine is one of the best strategy in prevention of the disease and reduce covid-19 related hospitalization). This finding was Similar with the study done in western part of Ethiopia Nekemte town, which proved that, 51.8% of health care givers had good level of response for an availability of Covid-19 vaccine to prevent the infection. This comparability might be justified by similarity of the study community and study population; But 76.9% of them did not know the effectiveness of the COVID-19 vaccine. Regarding to attitude (perception), 73% of respondents had good perception for covid-19 vaccine. The study conducted in Nekemte indicated that, 37% of health care workers had positively perceived the COVID-19 vaccine (15). This slight difference might be justified by difference perceived benefit.

In this particular study, being female in gender, got to be vaccinated Covid-19 vaccine. This finding is similar with the study conducted in Ghana and Addis Ababa Ethiopia, but higher in magnitude than the previous studies so far, which could be explained by none similarity of study population, area and period/time. Those who were clinically suspected were 2.3 times more likely got vaccination than those PCR confirmed. Single participants were 1.96 more likely got vaccinations than married. These findings might be justified that, previous exposure to certain disease might be increase the health belief model or planned behavior of certain individuals (a perceived susceptibility and severity). Concerning to the effectiveness of the vaccines, Astra Zeneca and Pfizer were 3.15, 2.9 times more likely effective than Johnson's johns. The intention of unwillingness to be vaccinated and concern of effectiveness might be justified that the health belief model (the perceived benefit) due to personal perception of effectiveness of certain various actions available to reduce the threat of illness or diseases.

Besides of different strengths, this study had some limitations. The disease is newly emerging pandemic and the vaccine is newly produced. So due to these problems, one of the drawbacks of this study was the limited number of literatures for further elaboration and discussion particularly for the source population. In Epidemiological study it is known that cross sectional study design cannot show cause-effect relationship between the outcomes and predictor variables (hen and egg dilemma issues) which might allow for the possibility of optimistic fallacy and external validity (generalizablity). This study is also aligned with these drawbacks. Regardless of these drawbacks, the findings of this study provide policy makers and program implementers to design behavioral change communication strategies and approaches to increase the uptake of Covid-19 vaccine acceptability and utilization among health care workers.

Conclusion

The magnitude of Covid-19 vaccine acceptability in health care workers in this study was 70.4%. In the study Being female in sex, Being exposed for the virus and become clinically suspected, Being single marital status and availability of AstraZeneca were an independent predictors of acceptability of Covid-19 vaccine in this study. So based on these findings further Comparative analysis supported by qualitative study as well as further knowledge and awareness based Health education model (champions client) with clinical importance is recommended.

Acknowledgements

Conflict of Interest

We declared that no conflicts of interest between authors.

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